

## **Device for the Induction of Raw Air for an Internal Combustion Engine**

The invention relates to a device for the induction of raw air for an internal combustion engine according to the first portion of claim 1.

Particularly for all-terrain vehicles, there has arisen the problem that the air for combustion that is sucked in from the outside when traveling overland, contaminated with dirty water, snow, sand and similar foreign objects or material is pulled into an air filter. Because of this, it becomes more difficult to supply raw air to the air filter or the air filter may become clogged.

As the solution to this problem, according to the invention, there is provided a device, which avoids these drawbacks and raw air free from contaminants can be supplied to the air filter container.

This is achieved through the features of claim one. Further advantageous features are contained in the sub-claims.

The main advantages achieved with the invention consist in the fact that, by way of the sealed off air accumulation chamber, a removal of water, snow and the like takes place, so that only pure raw air is drawn into an air intake stub of an air filter container. This is achieved in that at least one air intake stub of an air filter container empties out in one sealed off air accumulation chamber of the device, which is sealed off on the front side by a front end covering and, on the back side, by a separating partition that is convex in relation to and adjacent to the engine chamber. In this partition, in the area of the floor, there is provided at least one air intake opening, which

is connected with the air intake openings in the front end of the motor vehicle.

In particular, the air intake stub are each surrounded, on the free end, by an elastic form piece, which is placed tightly adjacent to the convex separating partition and to a front end covering. This results in a sealing off of the air accumulation air facing the engine chamber, so that the air that is fed in can be completely conveyed to the air filter container.

So that supply of air will reach the air accumulation chamber without significant losses, the air intake openings are placed immediately adjacent to the air intake openings in the front end of the vehicle. Furthermore, according to the invention, it is provided that the convex separating partition is placed with a tangential plane at an acute angle to the horizontal plane of the vehicle and that the air intake openings – in relation to direction of travel – are placed in the front area of the separating partition or on the floor of the separating partition and, with a height distance in immediate proximity to the outlet opening of the air intake stub. In this way, the impurities are separated out and precipitate in the low area of the space, because the outlet opening of the air intake stub or the air intake stubs is/are placed higher than the air intake openings in the separating partition. At the same time, the outer surface of the convex separating partition of the sealed off air accumulation chamber can be used as the air conveying surface for cool air to a cooling module.

The air intake openings may be equipped with a screen, a valve or the like, so that significant impurities in the air that is fed in can be filtered out, precipitated or held back even at the beginning.

One embodiment of the invention is described below in greater detail in the drawings.

Fig. 1 shows a diagrammatic representation on an accumulation chamber, leaving out the front end covering with air intake stub;

Fig. 2 shows a diagrammatic representation on an air intake stub of an air filter container connected with an elastic form piece.

Fig. 3 shows a cross-section through an air accumulation chamber placed in the front end of the motor vehicle and

Fig. 4 shows an additional cross-section through the air accumulation chamber with air intake stub and cooler module.

In front end 1 of a motor vehicle, there is placed sealed off air accumulation chamber 2, which is tightly closed off on the outside by a front end covering 3, on the inside by a convex separating partition 4 and on both front sides 5, 6 by an elastic form piece 7 with respect to the engine chamber.

In air accumulation chamber 2 there is at least one air intake stub 9 for raw air of an air filter container 10 that empties out, which is held in form piece 7 and tightly closed in on the end side, as shown in greater detail by fig. 2.

Separating partition 4 is designed to be convex and oriented inward in relation to engine chamber 8 and a tangential plane Y-Y of separating partition 4 is positioned at an acute angle  $\alpha$  to horizontal plane X-X of the motor vehicle.

In separating partition 4 there are provided – in relation to the direction of travel F – at least in the front area of separating partition 4, air

intake openings 11. These [openings] are placed with a height distance  $h$  and adjacent to outlet opening 12 of air intake stub 9 for raw air. In forward section piece 3 there are provided air intake openings 13, which convey air flow 14 to air intake openings 11 of separating partition 4 into air accumulation chamber 2.

In fig. 1, this space 2 is showed in greater detail in diagrammatic representation, and to hold front end covering 3, there is provided a grating-shaped bearing part 14, which, however, is completely covered by front end covering 3.

The air flow 14 entering through air intake openings 13 also opens up cooler module 15, which, in relation to the direction of travel  $F$  – is placed behind air accumulation chamber 2, while the convex separating partition 4 serves as an air-conveying surface.

Air intake openings 11 or 12 may also be covered by screens, valves or other similar means, so that snow, sand, water and other kinds of foreign material cannot get into space 2 or can [get in] only partially.

As can be seen, especially in fig. 3 and fig. 4, air 14 flows in by way of air intake openings 13 in front end 1 of the motor vehicle, and a partial airflow flows to cooler module 15 and an additional partial airflow flows through air intake openings 11 into air accumulation chamber 2, as shown by the arrows. The foreign bodies or foreign material, for example, which had been drawn in along [with the air], while traveling overland, are separated off, precipitated and caught, on account of outlet openings 12 of air intake stub 9 positioned higher than air intake openings 11, and therefore do not get into the air filter container.